LocalRoot: IANA DNS Root Zone Everywhere

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Why

- The root zone is critical infrastructure
  - Critical for positive answers
  - Critical(?) for negative answers

- Does it have to be critical infrastructure?
  - Not if every(?) recursive resolver pre-fetches the root zone

How

- RFCs: define implementation and deployment semantics
  - What is the expected behaviour
  - Leave implementation details to implementers

- Match existing implementations to continue as is
  - Match existing “mirror” / “pre-fetch” / “split-view” … implementations
  - Offer **one** pseudo-protocol way of implementing it

Defining Implementation Components

1. Identify where to get the IANA root zone

2. Fetching (and refetching) the IANA root zone

3. Integrating and serving the data

1. Where to get the IANA Root Zone Data

Choices outlined in the current document:

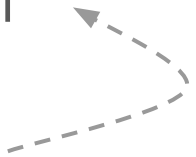
A. Operator configuration
B. Built in / compiled implementation or OS-distributed sources
C. From IANA

Somewhat akin to root.hints today

(we'll get to protocol usage in a bit)

2a. Fetching and using the IANA Root Zone Data

A. Iterate through the list of sources identified in step 1
B. Upon success, serve the results
C. Upon failure, return to A. and try the next source
D. Upon failure of all sources, use regular (non-LocalRoot) DNS



The RSS becomes an the emergency backup!

2b. Refetching: keep the IANA root zone data up to date

A. Use timers to check freshness
    a. Use efficient check-if-current methods:
        i. SOA via DNS
        ii. HTTP caching semantics (HEAD)

B. Use timers based on existing DNS standards
    a. SOA zone refresh time
    b. DNSSEC signature life times

3. Integrating the data

Describes behaviour – allows all these to remain conformant:

- RFC8806-like — authoritative server in parallel
- Combined recursive / auth-view — some software can “split view”
- Pre-caching — regardless of permanence

RECOMMENDED: use NSEC aggressive caching

LocalRoot Implementation Requirements *(shortened)*

- MUST be functionally indistinguishable
  - Return records very-similar to a non-LocalRoot implementation

- Security
  - MUST be configured with the IANA trust anchor
  - MUST verify the contents of the ZONEMD record
  - MUST verify the DNSSEC signatures on the ZONEMD record

- MUST ensure freshness

- SHOULD fallback to non-LocalRoot DNS on failures
  - *(or MUST SERVFAIL)*

Currently published as 4 drafts

draft-wkumari-dnsop-localroot-bcp	The LocalRoot specifications
draft-hardaker-dnsop-iana-root-zone-publication-points	IANA registry
draft-hardaker-dnsop-root-zone-pub-list-guidelines	Guidelines for IANA
draft-hardaker-dnsop-dns-xfr-scheme	AXFR:, IXFR:, XOT: URI schemes

Why 4? Separates goals, allowing separated progression/agreement

*The **actual** number of drafts/RFCs subject to WG adoption and decisions*

An IANA list of publication points

- draft-hardaker-dnsop-iana-root-zone-publication-points
  - Asks IANA to publish the list
  - Starts a discussion about list format *(I ~~suspect~~ know this will change)*
  - Lists some requirements of the list itself
    - e.g. it should be a “List of URLs”
  - Will coordinate with IANA to ensure acceptability

- draft-hardaker-dnsop-root-zone-pub-list-guidelines
  - Provides high level guidance to IANA about what should be in the list
  - Goals:
    - Minimal guidance that is helpful *(e.g. both DNS/AXFR and HTTP please)*
    - But not overly-prescriptive

draft-hardaker-dnsop-dns-xfr-scheme

- **IF** a list of URLs, **THEN** we need DNS/*XFR schemes
- Defines schemes for:
  - AXFR
  - IXFR
  - XoT
- Basic format is simple:
  - xot:ns.zone.example:8853/zone.example.
  - Detailed arguments left to “if adopted”

AXFR: vs HTTP(S):

- Note DNSOP discussion about in-vs-out of protocol
  - Also: names vs IPs

- Reality: different software today supports/promotes different protocols
  - Why is this a bad thing?

- Who should decide?
  - Operators: local config
  - Implementers: what they support / document
  - IETF: by mandate?

Summary

If the client gets the answer they need

With less dependencies

Profit!!

Adopt?

- Today’s presentation: layout the proposed goals and reasons
- Post adoption: refine the more intricate details